

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number
WO 2004/114433 A3

(51) International Patent Classification⁷: **H01M 10/44**,
H02J 7/14, H01L 25/00, G03B 7/08, 9/08

(21) International Application Number:
PCT/US2004/019271

(22) International Filing Date: 17 June 2004 (17.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/479,541 17 June 2003 (17.06.2003) US

(71) Applicant (for all designated States except US): **ECOSOL
SOLAR TECHNOLOGIES, INC.** [US/US]; 62 Valley
Forge Drive, East Brunswick, NJ 08816 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **KULAR, Andrew, C.**
[CA/CA]; 7 Hinton Avenue N., Ottawa, Ontario K1Y 4P1
(CA).

(74) Agent: **ONKA, Thomas, J.**; Synnestvedt Lechner &
Woodbridge LLP, P.O. Box 592, Princeton, NJ 08542
(US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,
ZW.

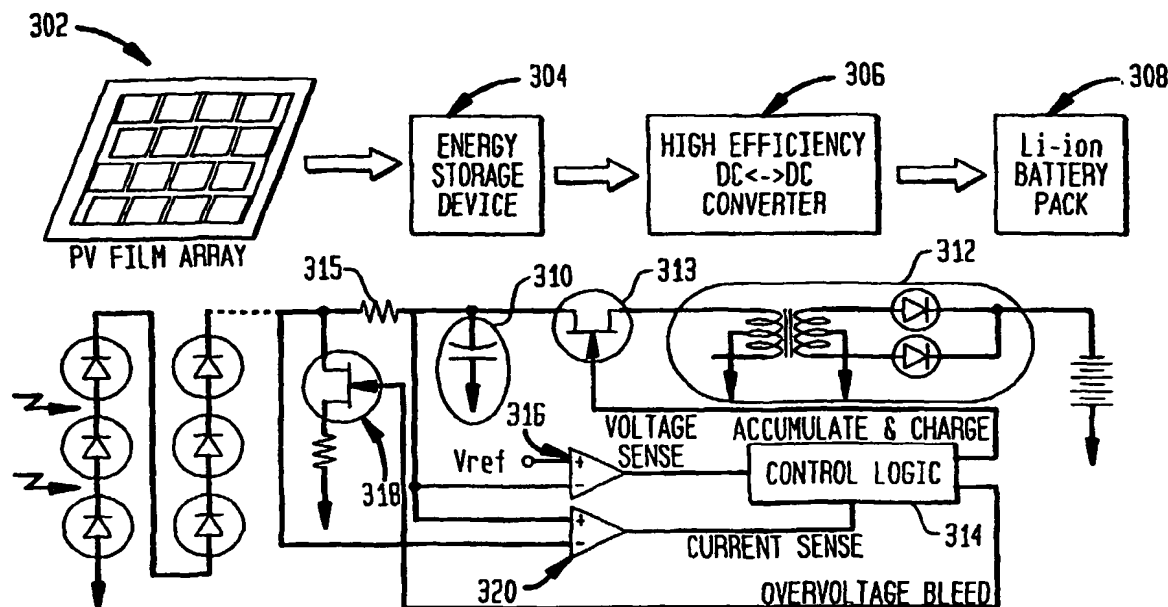
(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

[Continued on next page]

(54) Title: A TWO STAGE ENERGY STORAGE DEVICE



(57) Abstract: An electronic device, which captures and accumulates varying levels of electrical energy in suitable short-term storage means until the energy is of such a level that it can be efficiently transferred to at least one long-term storage device means, such as electro-chemical batteries. The invention further permits simultaneous transfer to a variety of electro-chemical batteries, which can possess different storage chemistries.



(88) Date of publication of the international search report:

2 June 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(19) World Intellectual Property
Organization
International Bureau



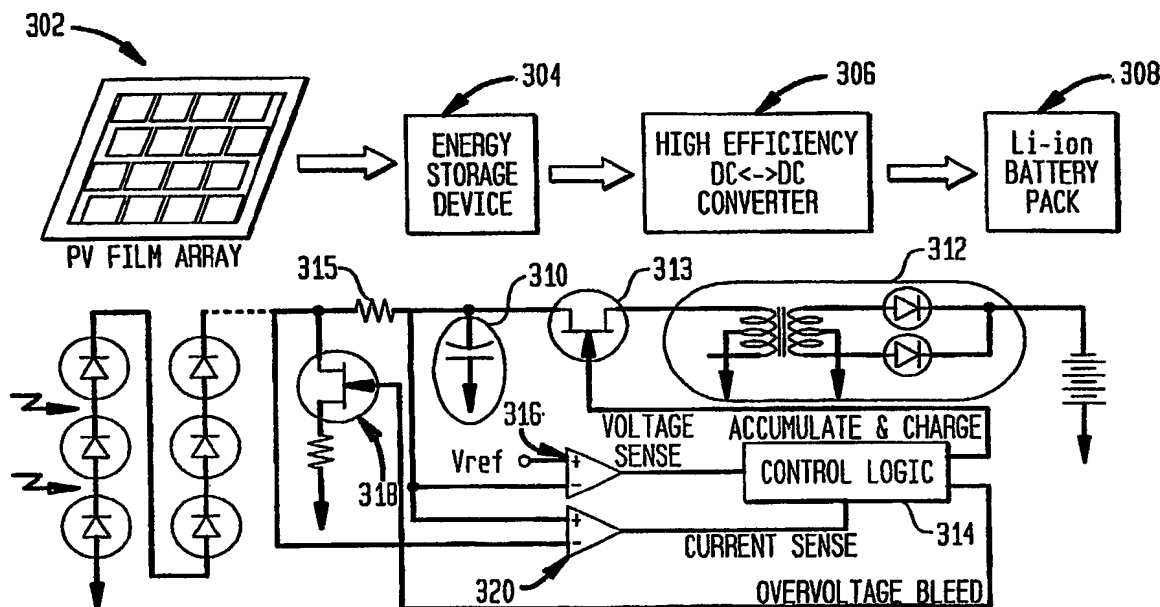
(43) International Publication Date
29 December 2004 (29.12.2004)

PCT

(10) International Publication Number
WO 2004/114433 A2

- (51) International Patent Classification⁷: **H01M**
- (21) International Application Number:
PCT/US2004/019271
- (22) International Filing Date: 17 June 2004 (17.06.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/479,541 17 June 2003 (17.06.2003) US
- (71) Applicant (for all designated States except US): **ECOSOL SOLAR TECHNOLOGIES, INC.** [US/US]; 62 Valley Forge Drive, East Brunswick, NJ 08816 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): **KULAR, Andrew, C.** [CA/CA]; 7 Hinton Avenue N., Ottawa, Ontario K1Y 4P1 (CA).
- (74) Agent: **ONKA, Thomas, J.**; Synnestvedt Lechner & Woodbridge LLP, P.O. Box 592, Princeton, NJ 08542 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— without international search report and to be republished upon receipt of that report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A TWO STAGE ENERGY STORAGE DEVICE



(57) Abstract: An electronic device, which captures and accumulates varying levels of electrical energy in suitable short-term storage means until the energy is of such a level that it can be efficiently transferred to at least one long-term storage device means, such as electro-chemical batteries. The invention further permits simultaneous transfer to a variety of electro-chemical batteries, which can possess different storage chemistries.